

## **A new program of surgical management for chronic thromboembolic pulmonary hypertension in the era of balloon pulmonary angioplasty in Japan**

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### **Abstract**

**Objective:** In Japan, a new challenge of balloon pulmonary angioplasty (BPA) for chronic thromboembolic pulmonary hypertension (CTEPH), in particular, for the distal pulmonary artery (PA) lesions, has been widely attempted with the favorable early outcome. In such circumstances, we started a new program of pulmonary endarterectomy (PEA) for patients with CTEPH including its marginal indications, the outcome of which is reviewed in this study.

**Patients:** Eighteen patients with CTEPH underwent PEA from 2012 to 2014. The mean age was  $63.4 \pm 13.2$  (range, 31 - 84) years old. The PA lesions were proximal in 15 and distal in 2. The mean PA pressure was  $39.4 \pm 7.2$  (range, 26 - 48) mmHg and the PVR was  $876.6 \pm 426.1$  (range, 362 - 1876)  $\text{dyn} \cdot \text{s} \cdot \text{cm}^{-5}$ . The WHO class was II in 6, III in 11, and IV in 1. One patient had the remarkably enlarged right PA and another a cavity of the right lower lobe due to atypical mycobacterial disease and poor left ventricular function of the ejection fraction  $< 40\%$  due to cardiomyopathy. In our protocol, a preoperative adjunct of continuous infusion of Epoprostenol was attempted, particularly, for 8 patients with severe PH and/or distal PA lesions.

**Results:** One patient (5.6%) with the enlarged right PA expired from residual PH and pulmonary bleeding, after concomitant mitral and tricuspid valve plasty with a Maze procedure. In the 2 patients including this patient, extracorporeal membrane oxygenation with IABP was employed, by which another difficult patient with the lung cavity survived. In terms of the improvement of PH of 17 survivors, 2 patients with residual PH underwent BPA even after PEA for further reduction of PH.

**Conclusions:** In the era of BPA, the indication of standard PEA have been limited, might be, for patients with the proximal PA lesions, otherwise for difficult ones with a variety of PA lesions. Better-established PEA with more adequate perioperative management is further mandatory.